**Month:** May 2024

- **NEWS FROM THE SOLAR SECTION**

May 2024 solar news

This month, there has been a notable surge in solar activity since the beginning of May, peaking on May 11th with significant Aurora displays. These Auroras were observed in regions where they are rarely, if ever, seen before. Notably, in South Africa, Auroras were witnessed as far north as Kuruman and Keimoes in the Northern Cape province.

The sunspot number for May increased from 136.5 to 171.7. Analysis of the sunspot number graph indicates a sharp upward trend, suggesting that the solar cycle's maximum has yet to be reached. Consequently, we can anticipate continued high sunspot numbers and elevated solar activity in the months ahead.

Space Weather Prediction Center
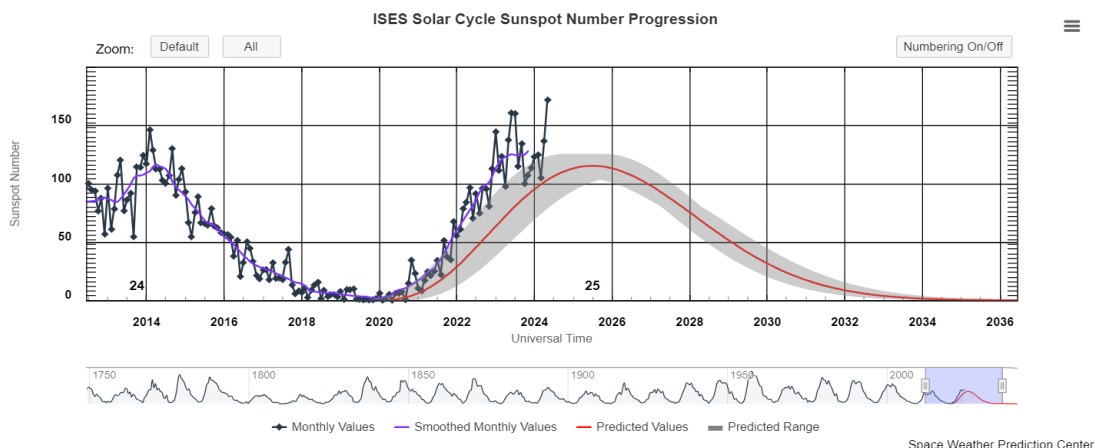
Solar storm event

On 11 May 2024 a high surge of geo magnetic activity was experience following days of High solar flare activity.
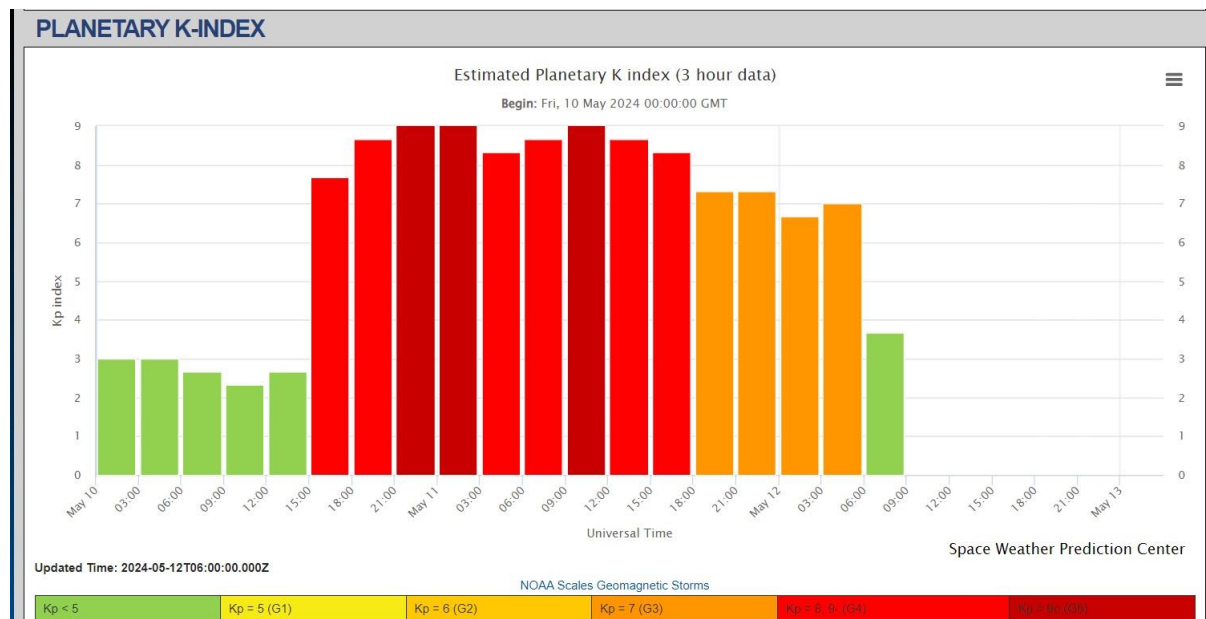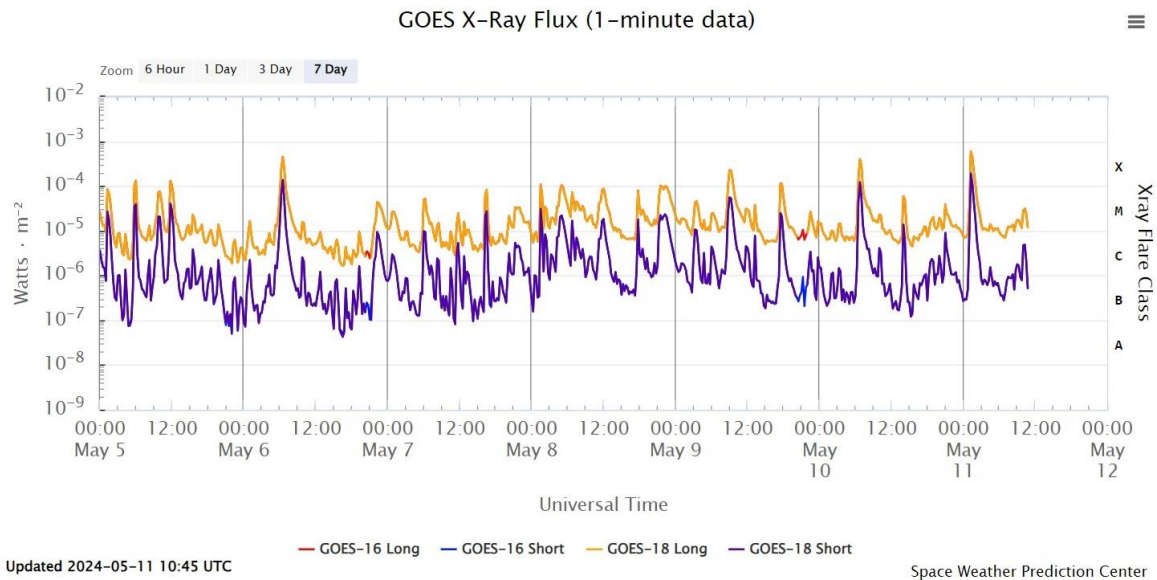
The Planetary K index was pushed to Kp 9 for more then 24 hrs from the 10th of May. The solar storm sparked Auroras n South Afrika as for north as Kuruman and Keimoes in the Northern Cape province. The storm was in the top 20 of the past 500 years.

SUNSPOT OBSERVATIONS

May 24	Day	Time	Seeing	Groups	Spots	W no.	North Groups	South groups	North spots	South spots
		Jacques v Delft		Jacques v Delft	Jacques v Delft	Jacques v Delft	Jacques v Delft	Jacques v Delft	Jacques v Delft	Jacques v Delft
Wed	1	1215	G	6	26	86	3	3	12	14
Thu	2	1230	G	6	32	92	3	3	22	10
Fri	3									
Sat	4	12h05	G	7	46	116	5	2	40	6
Sun	5	13H20	G	7	50	120	4	3	24	26
Mon	6	13H15	G	10	41	141	7	3	18	23
Tue	7	14H35	G	9	61	151	6	3	26	35
Wed	8	12H10	G	6	67	127	4	2	15	52
Thu	9	11H55	G	6	40	100	4	2	10	30
Fri	10	13H25	F	4	32	72	3	1	4	28
Sat	11	08H30	G	6	24	84	3	3	5	19
Sun	12	13H10	G	9	52	142	3	6	15	37
Mon	13	1330	F	12	54	174	6	6	36	18
Tue	14									
Wed	15	1255	G	11	30	140	6	5	13	17
Thu	16									
Fri	17	1530	G	10	28	128	3	7	4	24
Sat	18	1125	F	6	21	81	0	6	0	21
Sun	19	1230	G	9	43	133	2	7	3	40
Mon	20	1155	G	6	36	96	0	6	0	36
Tue	21	1220	G	8	38	118	0	8	0	38
Wed	22	1130	G	7	48	118	1	6	3	45
Thu	23	1240	G	9	53	143	2	7	2	51
Fri	24	1240	G	7	36	106	2	5	2	34
Sat	25	1220	F	7	22	92	2	5	7	15
Sun	26	1250	G	7	27	97	4	3	17	10
Mon	27	1230	G	8	38	118	5	3	27	11
Tue	28	1310	G	8	24	104	5	3	17	7
Wed	29	900	G	7	41	111	2	5	30	11
Thu	30	1215	G	6	25	85	4	2	15	10
Fri	31									
		Observations		Groups	Spots	W no.	North Groups	South groups	North spots	South spots
		18		204	1035	3075	89	115	367	668

Monthly Means		
MDF	170,8	1 Observer
MDF g	11,3	1 Observer
MDF Ng	4,9	1 Observer
MDF Sg	6,4	1 Observer

Observers:

Jacques van Delft   ASSA Bloemfontein South Africa

When more than 1 observer is submitting sunspots, the average per day is calculated and noted.

- **SOLAR FLARE ACTIVETY OCTOBER 2023**

Solar flares are classified according to their x-ray brightness in the wavelength range 1 to 8 Ångstrom. There are 3 categories: C class – minor, M class – medium and X class – big. Each category has 9 subdivisions.
A total of 303 solar flares were observed: 253 C-class flares and 45 M-class flares and 5 X class flares.

Solar flare data: LABORATORY OF X-RAY ASTRONOMY OF THE SUN
https://xras.ru/en/sun_flares.html

2024	May	C class	M class	X class	NOA No	
Wed	1	6	2	0	3654/3663	M1,8/M1,8
Thu	2	12	2	0	3663/3664	M1,0/M2,7
Fri	3	10	5	1	3664/3663/3654	M2,7/**X1,6** M1,0 M2,4/M1,2
Sat	4	14	6	0	3663	M1,6M9,1M1,5M1,3M32,M9,0
Sun	5	10	9	2	3663/3664	M8,4 **X1,3** M1,3 M7,4 **X1,2** M3,1 M2,2 M1,3/M2,3 M1,3 M1,0
Mon	6	15	5	1	3663	M1,6 M,3 **X4,5** M1,5 M1,2 M4,3
Tue	7	2	11	0	3663/3664	M2,6 M5,1 M1,5 M1,0 M8,2 M3,3 M3,2/M1,3 M2,4 M1,0 M2,1
Wed	8	2	11	4	3663/3664	**X1,0** M4,5 M1,8 M2,1 M4,1 M2,9 /M3,4 M1,8 M7,9 M2,0 M1,7 **X1,0 X1,0 X1,0** M9,8
Thu	9	0	12	2	3663/3664/??	M1,0/M4,0 M4,5 M1,7 M2,3 **X2,2** M3,1 M2,9 M3,7 **X1,1** M1,2 M1,5/M1,0 M2,6
Fri	10	3	10	1	3664	M1,3 M1,4 X3,9 M2,2 M5,9 M1,1 M1,7 M2,0 M1,1 M1,9 M3,8
Sat	11	4	5	2	3664	**X5,8** M3,1 M1,6 **X1,5**M1,7 M8,8 M1,2
Son	12	5	9	1	3664/3676/3679	M3,2 M4,2 M1,6 M1,5 **X1,0** M4,8 M1,1 M,0/M1,1/M1,0
Mon	13	7	6	0	3664/3674	M1,2 M1,2 M1,4 M6,6 M3,7 M1,5/M1,0
Tue	14	2	1	3	3664/3682	**X1,7 X1,2 X8,7**/M4,4
Wed	15	5	2	2	3664/3685	**X3,5**/M2,9 M3,2 **X2,9**
Thu	16	7	1	0	3685	M1,0
Fri	17	8	1	0	3685	M7,2
Sat	18	4	0	0		
Sun	19	4	3	0	3685	M1,9 M2,5 M1,6
Mon	20	5	0	0		
Tue	21	7	1	0	3679	M1,9
Wed	22	6	3	0	3679/3683	M1,5 M1,2/M2,3
Thu	23	18	5	0	3679/??	M4,2 M1,7 M2,5 M1,0/M1,0
Fri	24	8	3	0	3679	M1,4 M1,0 M1,4
Sat	25	3	0	0		
Sun	26	9	0	0		
Mon	27	8	0	1	3697	**X2,8**
Tue	28	27	0	0		
Wed	29	3	6	1	3691/3697	M2,7 M5,7/M1,3 M1,4 M1,8 M2,5 **X1,4**
Thu	30	2	1	0	3691	M1,0
Fri	31	15	1	1	3697	M1,0 **X1,1**
Sat						
Totals		231	121	22		

The M class flares in blue are from AR 3664 which contributed to the G5 geo magnetic storm on the 11th of May 24

Solar flare data May 2024
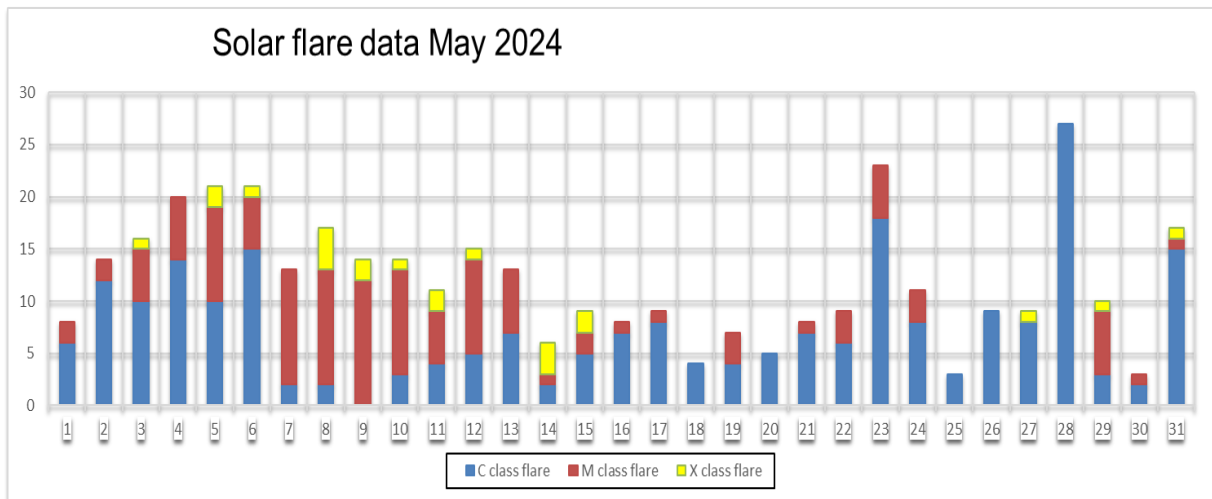
- **Geomagnetic data**

K INDEX

Scientists monitor geomagnetic activity using various instruments, including magnetometers and satellites, to better understand the processes involved and predict potential impacts on technological systems such as power grids, communication networks, and navigation systems as well as changes in our climate. Severe geomagnetic storms have the potential to disrupt these systems, making the study of geomagnetic activity crucial for both scientific understanding and practical applications.

Increased geo-magnetic activities are caused by Coronal Mass Ejections (CME's) triggered by solar activities such as solar flares, filament eruptions and Coronal openings.

The K-index scale has a range from 0 to 9 and is directly related to the maximum amount of fluctuation (relative to a quiet day) in the geomagnetic field over a three-hour interval.

Planetary https://www.swpc.noaa.gov/products/planetary-k-index

May 24	0hrs to 03hrs	03hrs to 06hr	06hrs to 09hr	09hrs to 12hr	12hrs to 15hr	15hrs to 18hr	18hrs to 21hr	21hrs to 24hr	A Index
1	3,67	2,33	1,67	0,67	1,00	1,33	2,67	1,67	8,00
2	2,67	2,00	2,67	3,33	5,00	6,67	6,67	4,33	44,00
3	4,33	3,33	1,33	1,67	1,33	1,00	1,67	2,00	10,00
4	1,33	1,33	0,67	1,00	1,00	1,00	1,00	3,00	6,00
5	2,00	1,33	2,33	2,33	1,67	1,67	3,33	4,33	12,00
6	5,00	2,33	2,33	2,67	3,67	2,00	2,33	1,67	15,00
7	2,00	2,00	1,33	2,00	2,33	2,33	1,67	1,67	7,00
8	1,33	2,33	1,67	2,67	2,00	2,00	1,00	1,33	7,00
9	1,00	2,00	1,00	2,33	1,33	1,33	2,33	2,33	7,00
10	3,00	3,00	2,67	2,33	2,67	7,67	8,67	9,00	11,80
11	9,00	8,33	8,67	9,00	8,67	8,33	7,33	7,33	27,30
12	6,67	7,00	3,67	3,67	2,67	2,67	4,00	6,33	54,00
13	5,67	6,00	4,00	2,67	3,33	2,67	2,67	3,00	30,00
14	2,00	1,67	1,67	2,00	2,33	1,67	1,67	1,00	6,00
15	1,67	2,00	2,67	2,33	2,33	1,67	3,00	2,67	10,00
16	2,67	3,33	6,00	4,67	4,67	3,00	2,33	1,33	27,00
17	2,00	2,67	2,00	2,00	3,33	5,00	6,00	5,33	29,00
18	3,67	3,33	2,33	3,33	2,67	2,33	1,33	1,33	12,00
19	1,33	2,67	1,67	2,33	3,00	2,00	2,33	1,67	9,00
20	1,33	2,67	2,33	1,67	2,33	1,00	1,00	2,33	7,00
21	2,00	1,67	1,33	2,67	3,00	2,67	1,67	1,67	9,00
22	2,00	0,67	0,67	0,67	0,33	0,67	1,67	2,00	4,00
23	1,00	2,00	1,67	2,33	2,67	2,00	2,33	4,00	10,00
24	2,00	2,67	2,67	3,33	2,33	1,67	0,33	2,00	9,00
25	1,67	1,67	1,33	0,67	1,33	2,00	1,33	2,67	6,00
26	1,67	2,67	1,33	2,33	3,00	2,33	3,00	1,33	10,00
27	1,33	1,00	2,33	3,00	2,33	1,33	1,00	2,67	8,00
28	2,67	2,00	2,00	1,00	1,00	0,67	1,00	1,00	6,00
29	0,67	1,33	2,00	1,67	1,33	2,00	2,33	2,00	6,00
30	1,00	1,67	1,67	2,00	2,00	3,00	2,00	3,00	8,00
31	2,67	4,67	2,67	1,67	2,33	2,00	1,67	1,67	12,00

Geomagnetic Storm Index

| G1	G2	G3	G4	G5

Credit: NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

A INDEX

The solar A Index is a numerical scale that represents the geomagnetic activity in the Earth's ionosphere caused by solar flares and other solar phenomena. It measures the overall geomagnetic disturbance level on a scale from 0 to 400. The index is derived from the observed planetary A index, which quantifies the magnetic activity over a 24-hour period.

Here's a breakdown of the solar A Index scale:

- · 0 to 7: Quiet geomagnetic conditions.
- · 8 to 15: Unsettled geomagnetic conditions.
- · 16 to 29: Active geomagnetic conditions.
- · 30 to 49: Minor storm levels.
- · 50 to 99: Major storm levels.
- · 100 and above: Severe storm levels.

A higher A Index generally indicates more disturbed geomagnetic conditions. This index is valuable for radio operators, especially those involved in high-frequency (HF) radio communication, as it helps predict the likelihood of signal disruptions due to solar activity. The solar A Index is typically updated regularly and is an important tool for space weather monitoring and forecasting.
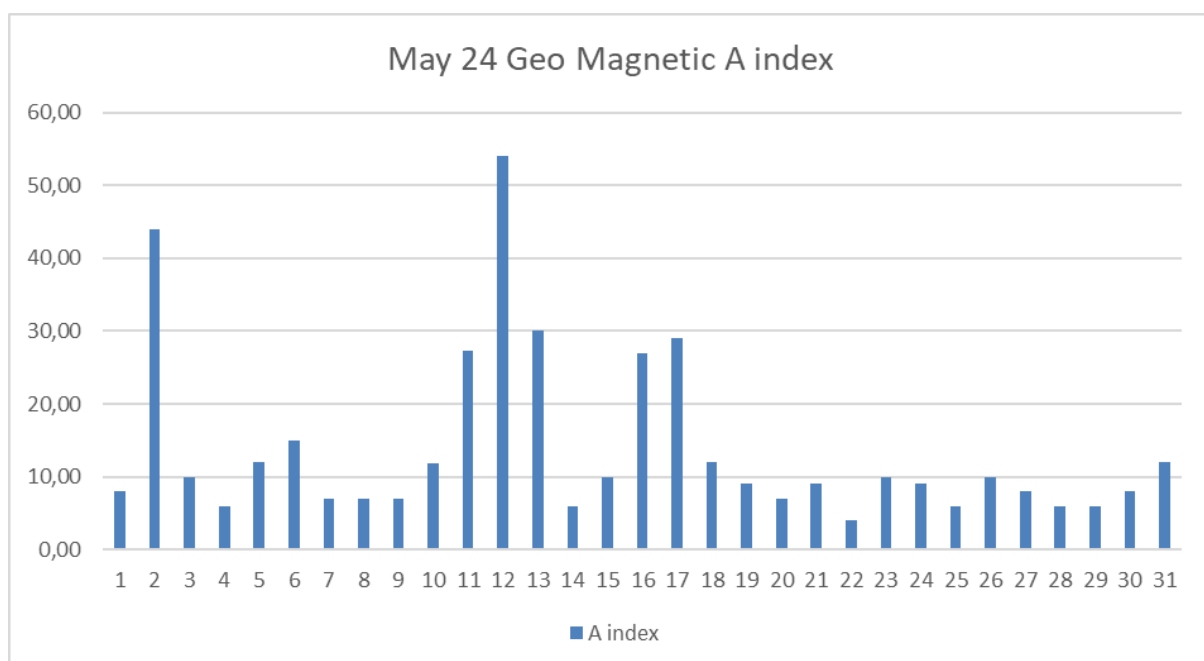
Periods of high Geo-magnetic activities were experienced in May and special notice must be made on the G5 / KP 9 storm condition experienced on 11 May 24 which sparked high Aurora activities and high disturbance in the Earths atmosphere.

- • **H Alpha Observations**

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Two observer shared their H-Alpha data for May 2024. Andrew Devey from BAA & MSAS living in Spain using a PST double stack H Alpha telescope and Mick Nicholls from BAA & MSAS living in the UK.

April 2024	Counts	Observations	MDF
Prominance	152	30	5,1
Plage Areas	131	30	4,4
Filaments	213	30	7,1
Flares	9	30	0,3

- **Solar images**

WHITE LIGHT

06 May 2024 13h15 UTC South Africa
Celestron Astro Fi 130 mm
Huawei nova Y9a cellphone camera
Sunspot number = 141

Jacques van Delft ASSA South Africa

11 May 2024 08h30 UTC South Africa

Celestron Astro Fi 130 mm

Huawei nova Y9a Cellphone camera

Sunspot AR3664 causing highest geo magnetic storm of solar cycle 25.   KP 9 recorded

Jacques van Delft ASSA South Africa

AR3684   AR3679

AR3686   AR3674

AR3685

AR3689

AR3688   AR3683

Bloemfontein South Africa, 21 May 2024
Celestron Astro F1 130 mm F 650 mm (f/5)
Eyepiece 25 mm
Camera: Huawei nova Y9a
Time: 12h20 UT

Jacques van Delft ASSA South Africa

SUN IN WHITE-LIGHT 6th MAY 2024 @09.00amGMT
80mm STARWAVE ED-R REFRACTOR   HERSCHEL WEDGE   ZWO ASI174MM CAMERA
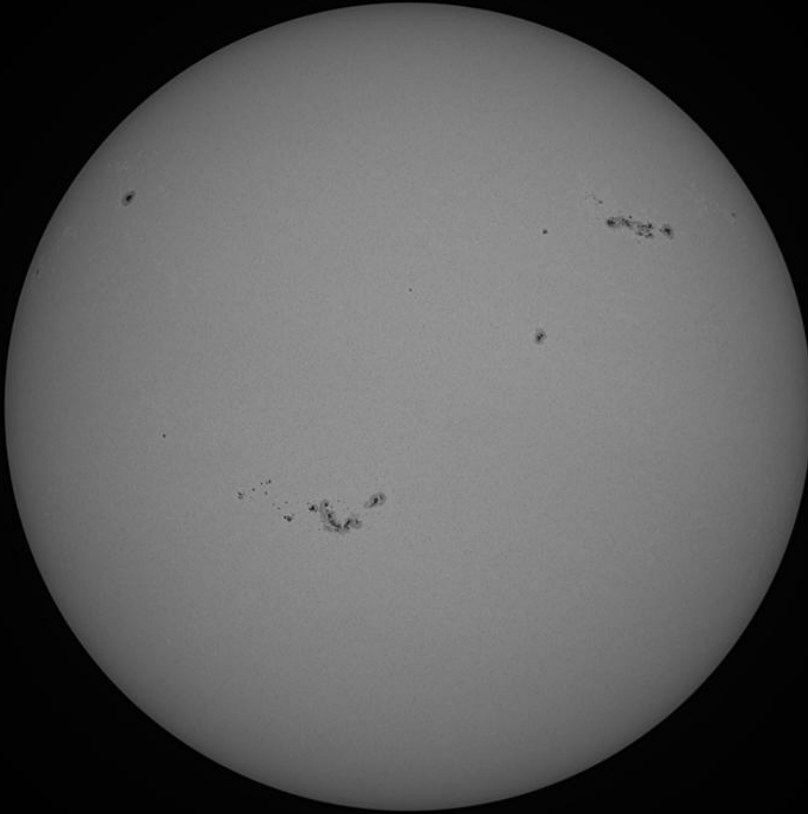
Mick Nicholls BAA/MSAS, United Kingdom

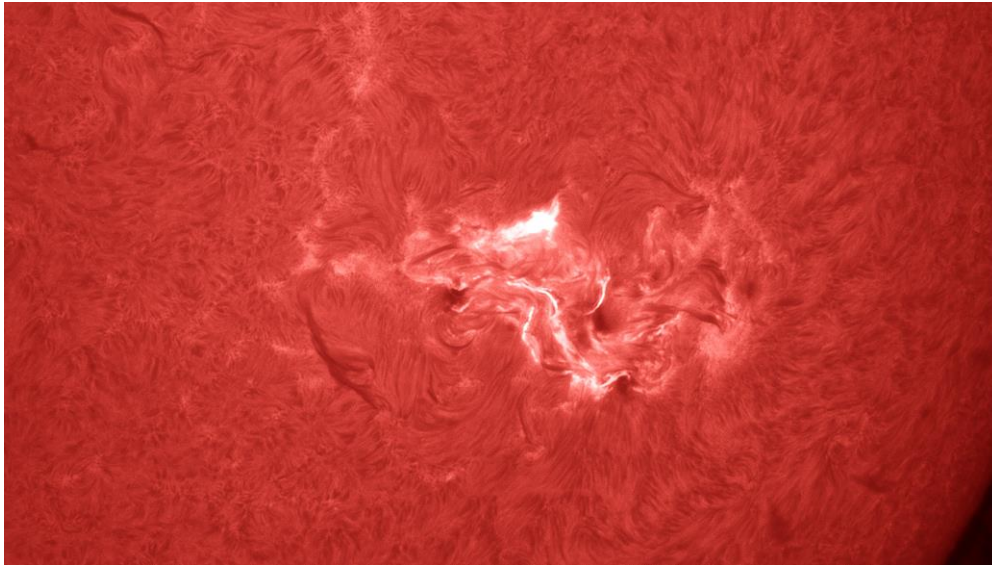Stephanus du Toit South Africa
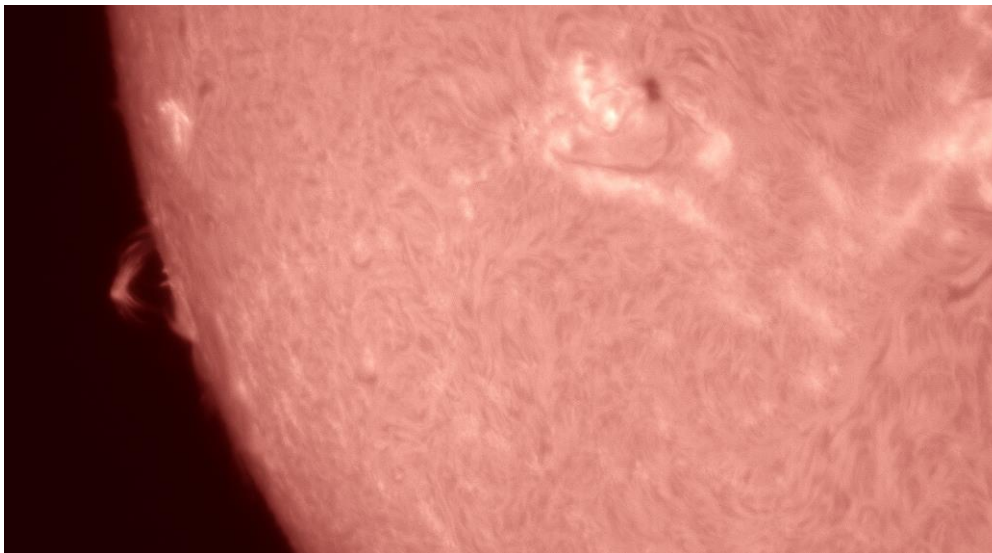

Stephanus du Toit South Africa

H-Alpha

Mick Nicholls BAA/MSAS, United Kingdom
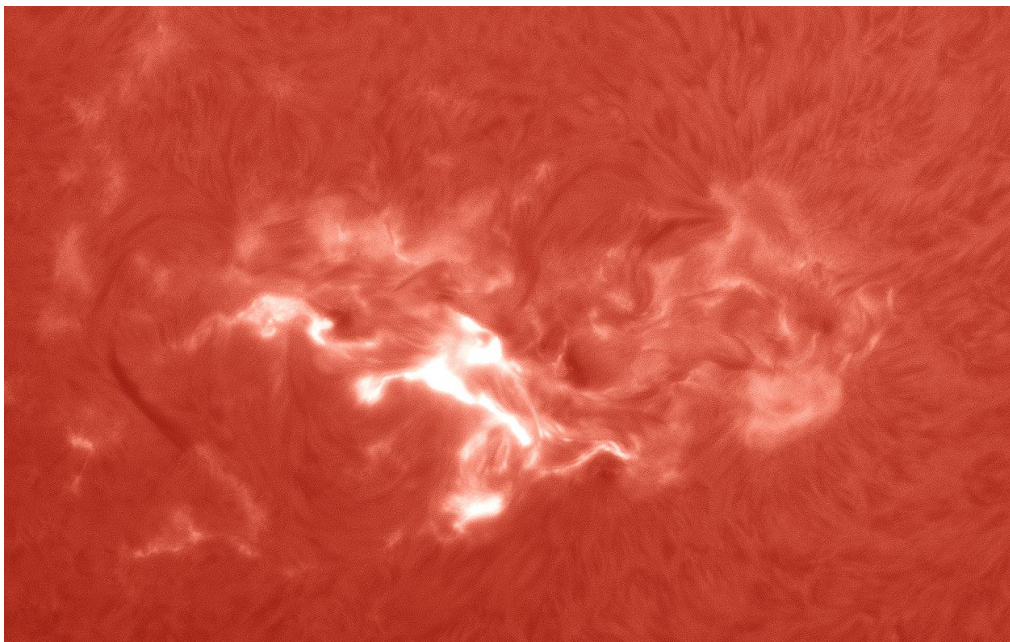
Andrew Devey, BAA/MSAS Spain. 2024-05-09-0900UT_X2.2 flare AR3664
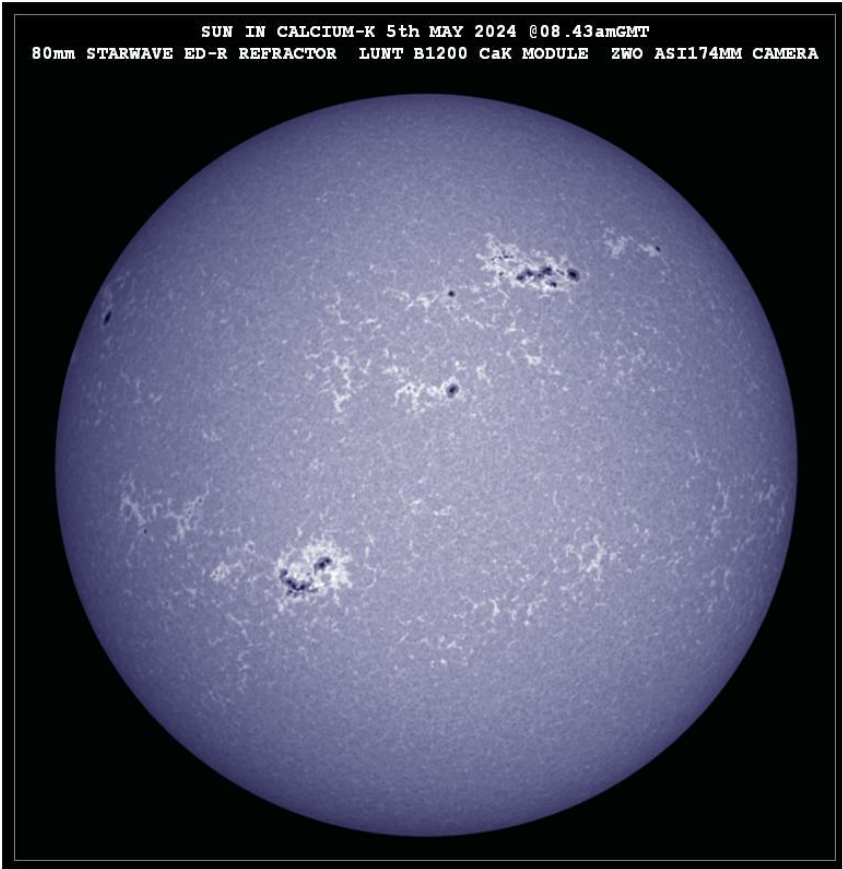
Andrew Devey, BAA/MSAS Spain. 2024-05-10-0730UT_X3

Andrew Devey, BAA/MSAS Spain. 2024-05-15-1536UT_X3 coloured

Jacques van Delft ASSA South Africa

Ca-K

SUN IN CALCIUM-K 5th MAY 2024 @08.43amGMT
80mm STARWAVE ED-R REFRACTOR LUNT B1200 CaK MODULE ZWO ASI174MM CAMERA

Mick Nicholls BAA/MSAS, United Kingdom

Aurora, Bloemfontein 11 May 2024 at Boyden Observatory

credits BOOTES-6 (IAA-CSIC/UFS/UCD)

I would like to thank the contributors for their valuable inputs.
Clear Skies

Jacques van Delft

ASSA Solar Section